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**REMARKS**

Claims 1-63 are pending in the present Application. Claims 1-15, 32, 53-58, and 61-62 have been withdrawn as a result of a restriction requirement. Claims 16, 37, and 59 have been amended. Applicants submit that no new matter was added by these amendments. No claims have been added or canceled, leaving Claims 16-31, 33-52, 59-60, and 63 for consideration. Applicants appreciate the indication that Claim 63 has been deemed allowable.

Reconsideration and allowance of the claims are respectfully requested in view of the above amendments and the following remarks.

**First Claim Rejection**

Claims 16-23, 26-31, 33-40, and 43-52 have been rejected under 35 U.S.C. § 102(b), as allegedly anticipated by, or in the alternative, under 35 U.S.C. § 103(a), as allegedly obvious over, an article by Padture et al. entitled "Towards Durable Thermal Barrier Coatings with Novel Microstructures Deposited by Solution Precursor Plasma Spray (Acta Mater. 49 (2001) 2251-2257) (hereinafter "Padture"). Applicants respectfully traverse this rejection.

To anticipate a claim, a reference must disclose each and every element of the claim. *Lewmar Marine v. Variant Inc.*, 3 U.S.P.Q.2d 1766 (Fed. Cir. 1987). See MPEP 2131. Also, to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). See MPEP 2143.03.

Independent Claims 16 and 37 pertain to a material/thermal barrier coating comprising splats having an average diameter of greater than about 0.1 micrometer and less than or equal to about 2 micrometers. Padture fails to teach or suggest this particular splat size. In contrast, Padture discloses that conventional plasma-sprayed thermal barrier coatings are typically several hundreds of microns long. Padture describes depositing coatings using solution precursor plasma

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spray (SPPS). Padture specifically claims that the most important feature of such coatings is the absence of horizontal splats. See the paragraph spanning pages 2253-2254 of Padture.

Applicants respectfully disagree with the Examiner's contention that the aggregate shown in Figure 4(a) of Padture would meet the limitation of being a splat having the claimed dimensions. Applicants respectfully request the Examiner to review the 37 CFR § 1.132 Declaration submitted herewith. In this Declaration, Dr. Maurice Gell, who is both an inventor of the present application and an author of Padture, declares the following: "Padture relates to forming ZrO<sub>2</sub>-based thermal barrier coatings (TBCs) using a solution precursor plasma spray (SPPS) method. Padture describes the absence of splats in the SPPS-deposited TBCs shown in Figures 2 and 3. Moreover, the "rounded" aggregate shown in Figure 4(a) would not meet the limitation of being a splat having the claimed dimensions, as contended by the Examiner in the Office Action dated November 15, 2006. The material shown in Figure 4(a) was obtained by crushing an SPPS-deposited TBC and placing the resulting particles on a fine mesh grid. Each particle is believed to be representative of the general coating structure. The grid with the particles was placed in a transmission electron microscope (TEM). The thinnest particles could be imaged. The TEM image of those particles are depicted in Figure 4(a). The TEM image shows a random polycrystalline grain structure. In contrast, splats formed in an air plasma spray process appear as a columnar-grain structure. This columnar-grain structure results from the nucleation of many grains at the interface between the newly arriving molten splat and the previously deposited and solidified splats. There is a unidirectional extraction of heat normal to the splats that produce columnar grains parallel to the direction of heat flow. There is no evidence in Figure 4(a) of a columnar-grain structure that is characteristic of splats."

Accordingly, Applicants respectfully request reconsideration and withdrawal of the foregoing rejection applied to independent Claims 16 and 37 and dependent Claims 17-23, 26-31, 33-36, 38-40, and 43-52, which depend therefrom, in view of Padture.

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Second Claim Rejection

Claims 59-60 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Padture as applied to claims 16-23, 26-31, 33-40, and 43-52 above, further in view of U.S. Patent Application Publication No. 2002/0031658 to Chow et al. (hereinafter "Chow").

Independent Claim 59, which pertains to a coating comprising splats, includes the limitation that greater than or equal to about 90% of the splats are splats having an average diameter of greater than about 0.1 micrometer and less than or equal to about 2 micrometers (microns). As described above, Padture fails to teach or suggest this particular splat size. Chow also fails to teach or suggest splats having this particular size. In contrast, Chow discloses that conventional thermal spraying can form splats having a thickness of at least several microns (see paragraph 45 of Chow), which would be greater than 2 microns. Moreover, Chow describes a thermal spraying technique that uses solution precursors as a feedstock to form coatings made of nanostructured particles which have a diameter of less than about 0.1 micron (see paragraph 44 of Chow). Chow also indicates that the thickness of the splats formed are equal to the dimension of the particles formed (see paragraph 45, 1<sup>st</sup> sentence of paragraph 45). As such, Chow's process forms splats having a thickness of less than about 0.1 micron, which is outside the claimed splat size.

Based on the foregoing remarks, Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. § 103(a) rejection applied to independent Claim 59 and dependent Claim 60, which depends therefrom, in view of Padture and Chow.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance are requested.

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If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

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